

What is claimed is:

- 1 1. A method of interleaving data over a plurality frames, comprising:
2 interleaving the data according to a first algorithm over plural frames
3 communicated over a wireless channel for a first set of data; and
4 interleaving the data according to a second algorithm over plural frames
5 communicated over the wireless channel for a second set of data.
- 1 2. The method of claim 1, wherein interleaving the data according to the first
2 or second algorithm comprises interleaving speech data.
- 1 3. The method of claim 1, wherein interleaving the data according to the first
2 or second algorithm comprises interleaving over frames of a multiframe.
- 1 4. The method of claim 3, wherein interleaving over frames of the
2 multiframe comprises interleaving over a General Packet Radio Service multiframe.
- 1 5. The method of claim 3, wherein the multiframe comprises plural blocks,
2 each block having four frames, each frame containing plural bursts, and the data is
3 carried in data frame N starting in block B(x), and wherein interleaving the data frame N
4 according to the first and second algorithms comprises interleaving the data frame N over
5 blocks B(x + 2k) and B(x + 2k + 2), where k = INT(N/2).
- 1 6. The method of claim 5, wherein interleaving the data according to the first
2 algorithm comprises interleaving the data frame N over bursts in the last three frames in
3 block B(x + 2k) and the first frame in block B(x + 2k + 2), if N is even.
- 1 7. The method of claim 6, wherein interleaving the data according to the
2 second algorithm comprises interleaving the data frame N over bursts in the last frame in
3 block B(x + 2k) and the first three frames in block B(x + 2k + 2), if N is odd.

1 8. The method of claim 7, wherein interleaving the data according to the first
2 and second algorithms comprises interleaving speech data.

1 9. The method of claim 8, wherein interleaving the speech data comprises
2 interleaving speech data of a half-rate mobile station.

1 10. The method of claim 7, further comprising:
2 receiving an end-of-data indicating frame to indicate that the data frame N
3 is the last data frame; and
4 interleaving the end-of-data indicating frame over bursts in the last frame
5 in block $B(x + 2k)$ and the first two frames of block $(Bx + 2k + 2)$, if M is even.

1 11. The method of claim 10, further comprising repeating the end-of-data
2 indicating frame over bursts in the last two frames of block $B(x + 2k + 2)$.

1 12. The method of claim 10, further comprising interleaving the end-of-data
2 indicating frame over bursts in the last three frames of block $B(x + 2k + 2)$, if M is odd.

1 13. The method of claim 3, wherein the multiframe comprises plural blocks
2 and each block comprises plural frames, each frame containing plural bursts, the data
3 being carried in data frames interleaved over bursts in the plural frames, the method
4 further comprising:
5 receiving an end-of-data indicating frame to indicate that a data frame is
6 the last data frame; and
7 interleaving the end-of-data indicating frame according to predetermined
8 algorithms,
9 wherein interleaving the data frames according to the first and second
10 algorithms and the end-of-data indicating frame according to the predetermined
11 algorithms enables the end-of-data indicating frame to end within the same block
12 carrying the last data frame.

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1 14. The method of claim 13, wherein the last data frame is data frame M
2 starting in block B(x), wherein, if M is odd, interleaving the data frame M comprises
3 interleaving the data frame M over bursts in the last frame in block B(x) and the first
4 three frames of B(x + 2), and wherein interleaving the end-of-data indicating frame
5 comprises interleaving the end-of-data indicating frame over bursts in the last three
6 frames of block B(x + 2).

1 15. The method of claim 14, wherein, if M is even, interleaving the data frame
2 M comprises interleaving the data frame M over bursts in the last three frames in block
3 B(x) and first frame in block B(x + 2), and interleaving the end-of-data indicating frame
4 comprises interleaving the end-of-data indicating frame over bursts in the last frame in
5 block B(x) and first two frames in block B(x + 2).

1 16. The method of claim 15, wherein the end-of-data indicating frame
2 comprises a SID_FIRST frame according to a General Packet Radio Service protocol.

1 17. A system for communicating over a wireless channel in a mobile
2 communications network, comprising:
3 an interface adapted to receive traffic data frames from a half-rate mobile
4 station; and
5 a controller adapted to interleave a first data frame over plural bursts
6 according to a first algorithm and to interleave a second data frame over plural bursts
7 according to a second algorithm.

1 18. The system of claim 17, wherein the traffic data frames comprise speech.

1 19. The system of claim 17, wherein each data frame is interleaved over four
2 bursts.

1 20. The system of claim 17, wherein the bursts are part of a multiframe, the
2 multiframe comprising plural blocks, each block comprising four bursts, and wherein

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3 data frames I , $I = 0$ to M , are received starting in block $B(x)$, the controller adapted to
 4 interleave data frame I over blocks $B(x + 2k)$ and $B(x + 2k + 2)$, where $k = \text{INT}(I/2)$.

1 21. The system of claim 20, wherein the controller is adapted to:
 2 for I being even, interleave traffic data frame I over the last three bursts in
 3 block $B(x + 2k)$ and the first burst in block $B(x + 2k + 2)$; and
 4 for I being odd, interleave traffic data frame I over the last three bursts in
 5 block $B(x + 2k)$ and the first burst in block $B(x + 2k + 2)$.

1 22. The system of claim 21, wherein the interface is adapted to further receive
 2 an end-of-data indicating frame, the end-of-data indicating frame interleaved a first way
 3 if M is even and a second way if M is odd.

1 23. The system of claim 22, wherein the controller is adapted to:
 2 for M being even, interleave the end-of-data indicating frame over the last
 3 burst in block $B(x + 2k)$ and the first two bursts in block $B(x + 2k + 2)$; and
 4 for M being odd, interleave the end-of-data indicating frame over the last
 5 three bursts of $B(x + 2k + 2)$.

1 24. The system of claim 23, wherein the end-of-data indicating frame
 2 comprises a `SID_FIRST` frame according to a General Packet Radio Service protocol.

1 25. The system of claim 23, wherein the end-of-data indicating frame
 2 indicates that discontinuous transmission mode is starting.

1 26. The system of claim 23, wherein the traffic data frames are carried in a
 2 wireless channel portion, the interface adapted to receive traffic data frames from another
 3 mobile station in block $B(x + 2k + 4)$.

1 27. The system of claim 26, wherein the traffic data frames from the half-rate
 2 mobile station comprises speech data.

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1 28. The system of claim 27, wherein the traffic data frames from the other
2 mobile station comprises another type of data.

1 29. The system of claim 27, wherein the other mobile station comprises a full-
2 rate mobile station.

1 30. An article comprising at least one storage medium containing instructions
2 that when executed cause a system to:
3 receive traffic over a wireless channel portion from a first mobile station
4 involved in half-rate communication;
5 detect that the first mobile station has entered discontinuous transmission
6 mode; and
7 multiplex traffic from a second mobile station onto the wireless channel
8 portion while the first mobile station is in discontinuous transmission mode.

1 31. The article of claim 30, wherein the instructions when executed cause the
2 system to receive speech traffic from the first mobile station.

1 32. The article of claim 31, wherein the instructions when executed cause the
2 system to receive another type of traffic from the second mobile station.

1 33. The article of claim 30, wherein the instructions when executed cause the
2 system to interleave a first traffic frame from the first mobile station over plural bursts
3 according to a first algorithm and to interleave a second traffic frame from the first
4 mobile station over plural bursts according to a second algorithm.

1 34. A data signal embodied in a carrier wave and containing instructions that
2 when executed cause a system to:
3 interleave a first speech traffic frame from a mobile station over plural
4 bursts according to a first algorithm; and

5 interleave a second speech traffic frame from the mobile station over
6 plural bursts according to a second algorithm.

1 35. A system for use in a mobile communications network, comprising:
2 a wireless interface adapted to receive traffic over a wireless channel
3 portion from a first mobile station involved in half-rate communications; and
4 a controller adapted to receive an indication that the first mobile station
5 has entered discontinuous transmission mode and to multiplex traffic from a second
6 mobile station onto the wireless channel portion while the first mobile station is in
7 discontinuous transmission mode.

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